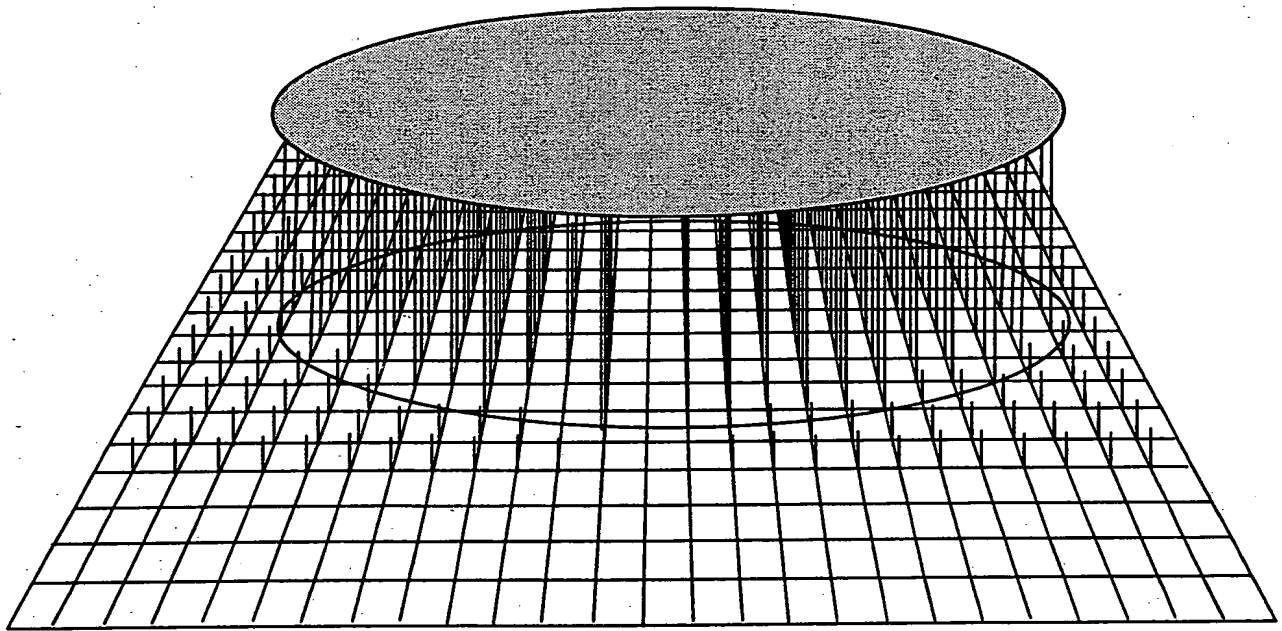


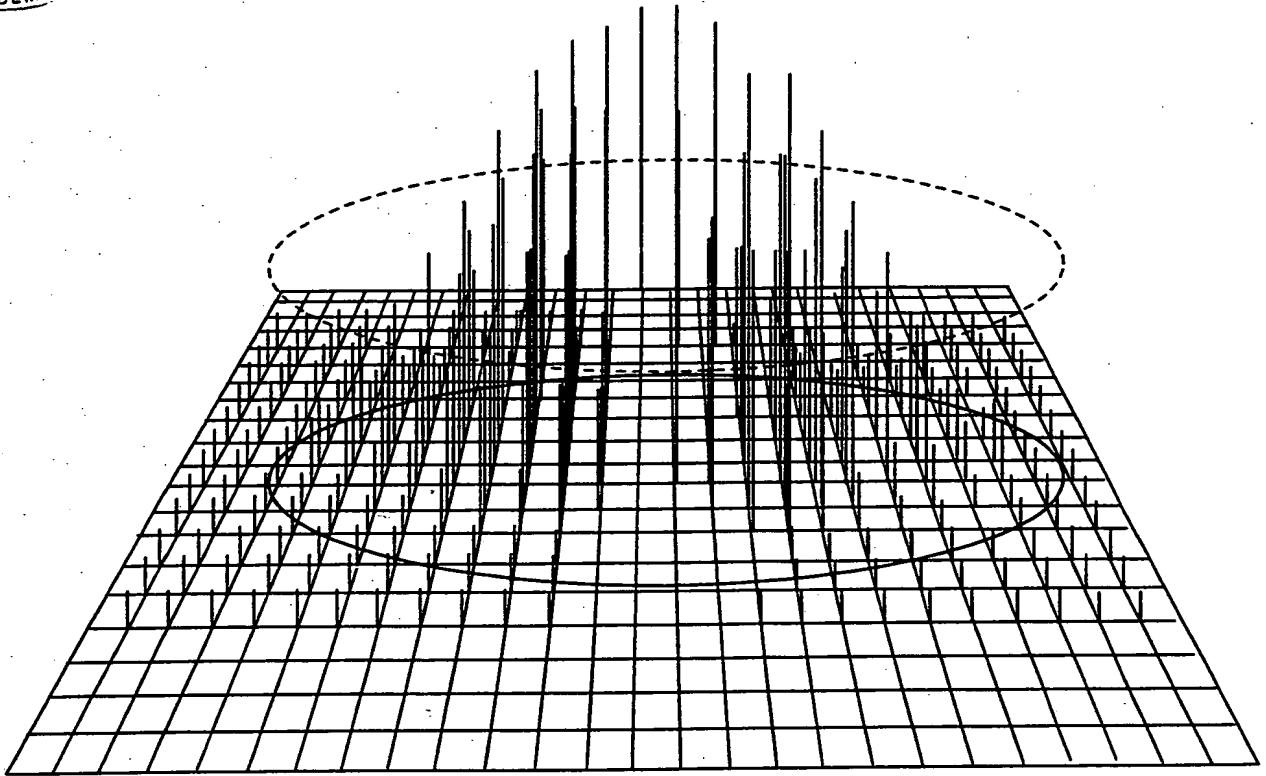


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**Fig. 1**

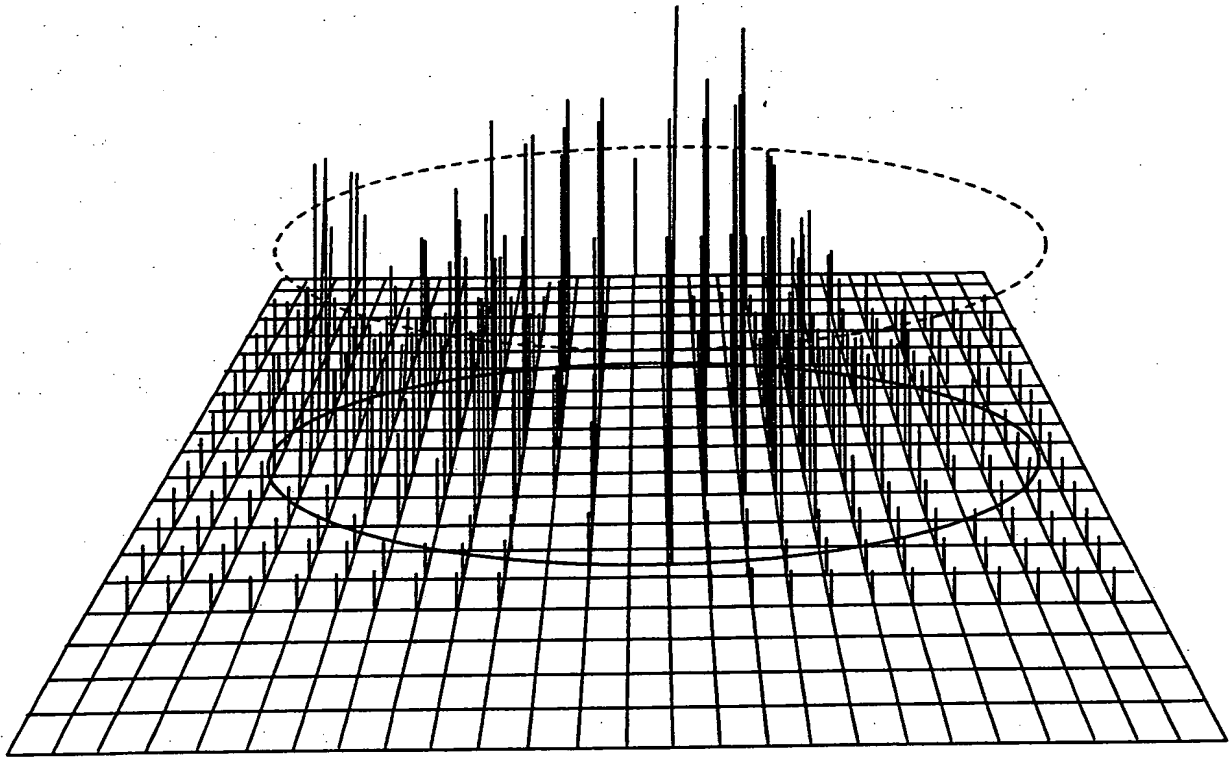
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**Fig. 2**



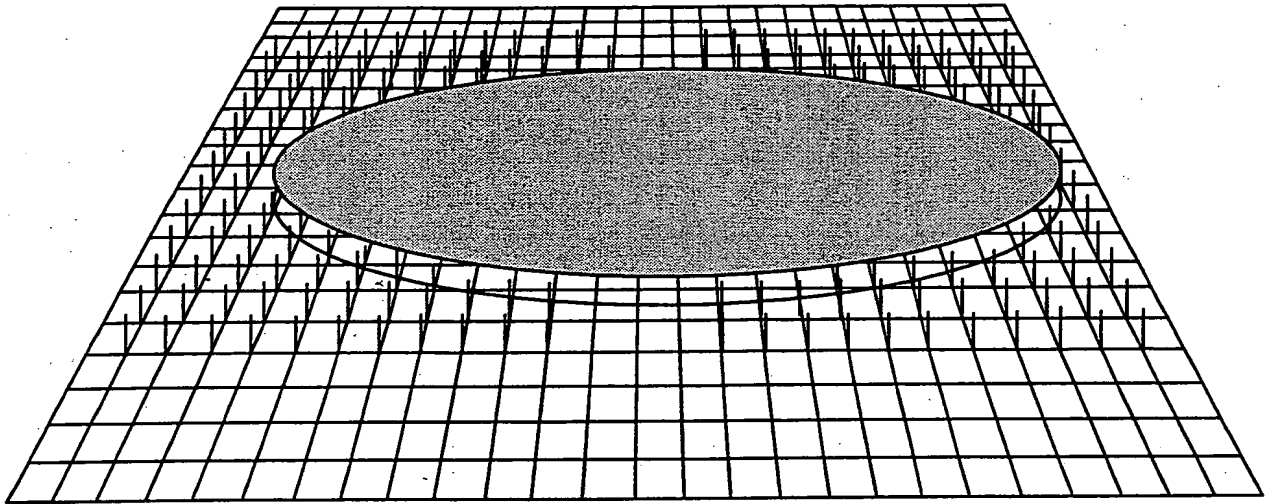
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**Fig. 3**

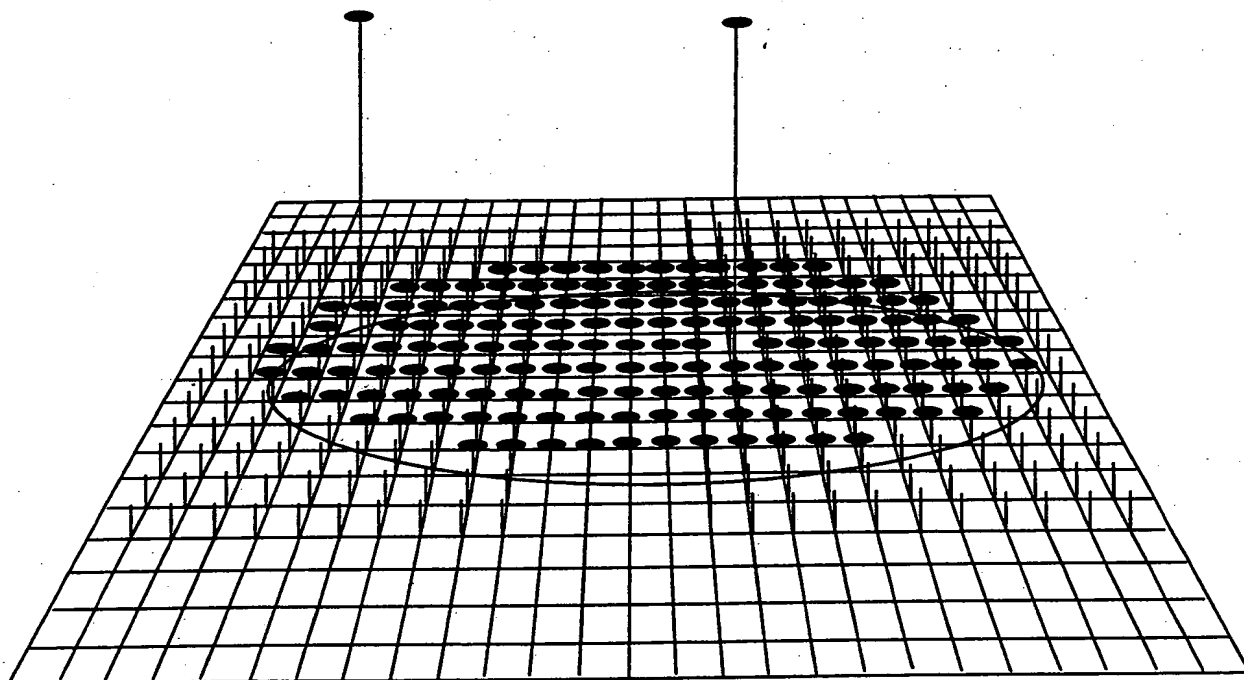
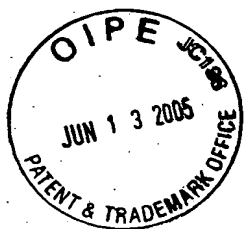


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**Fig. 4**

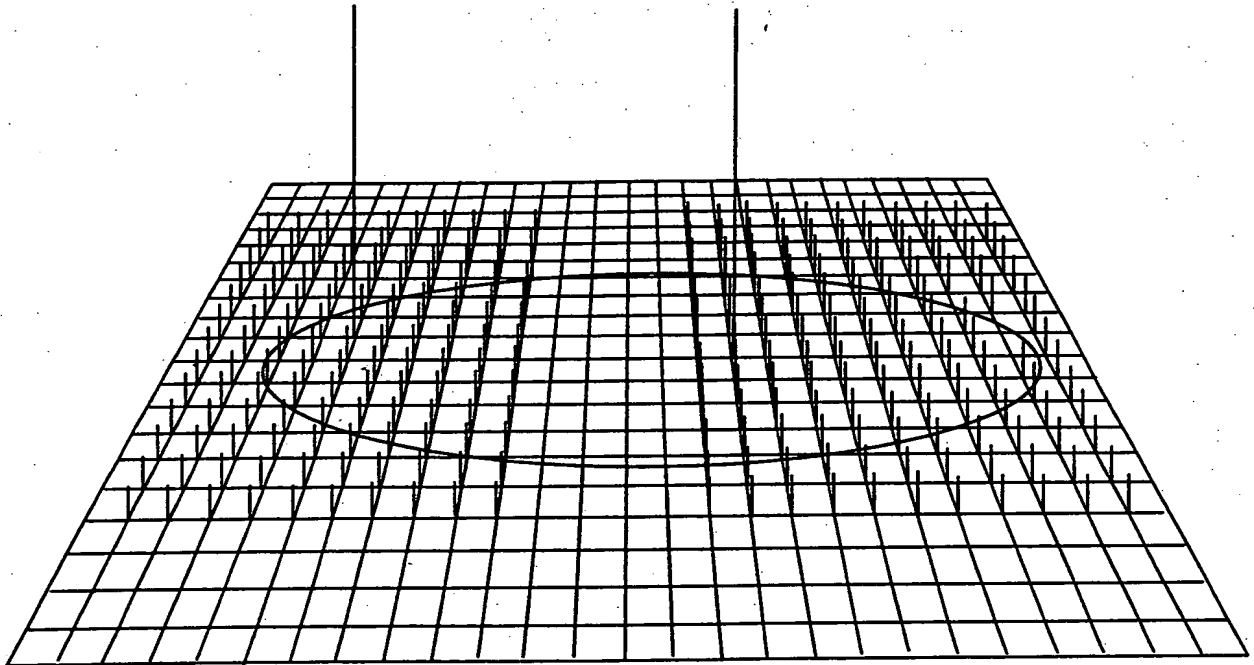
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**Fig. 5**

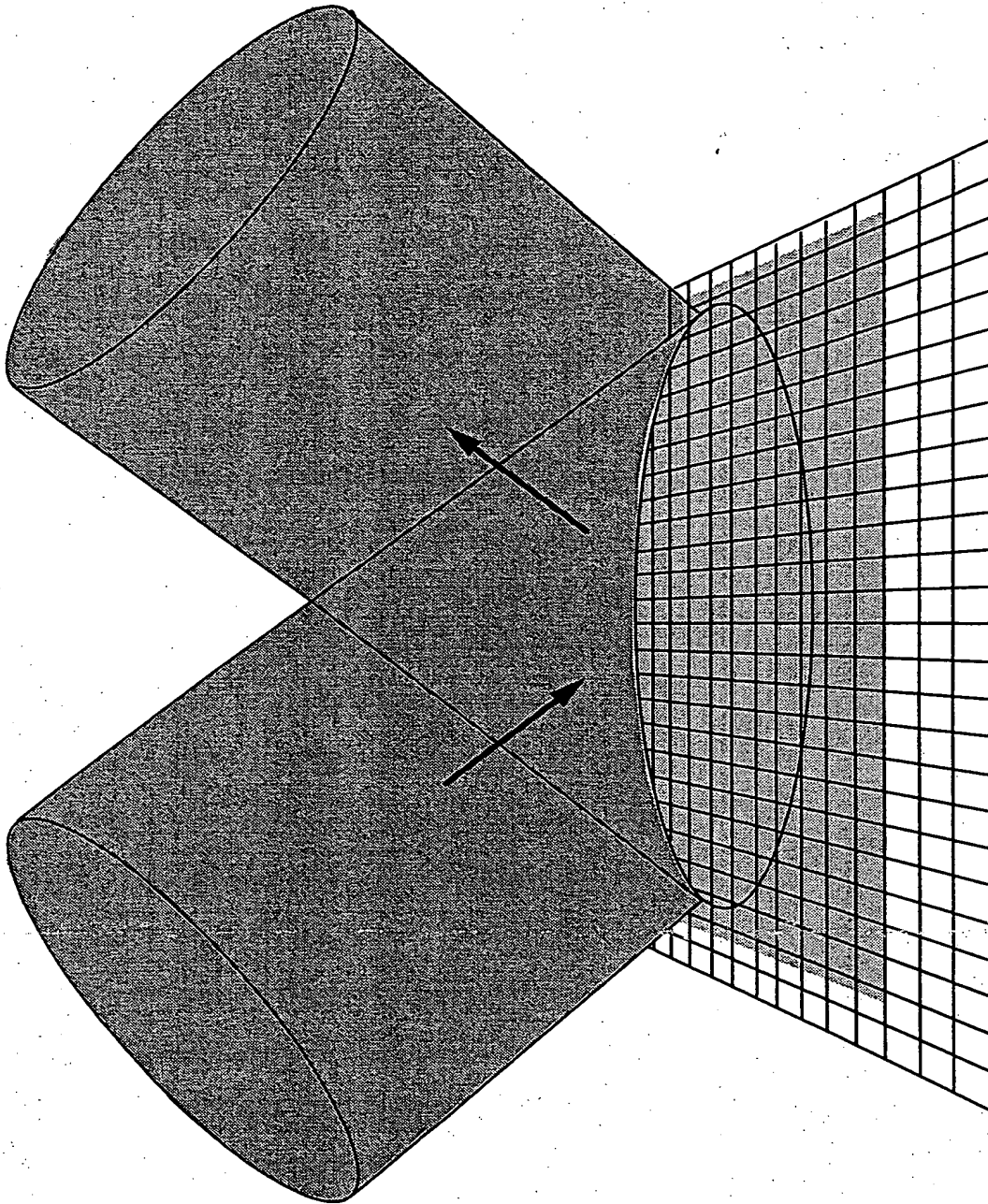


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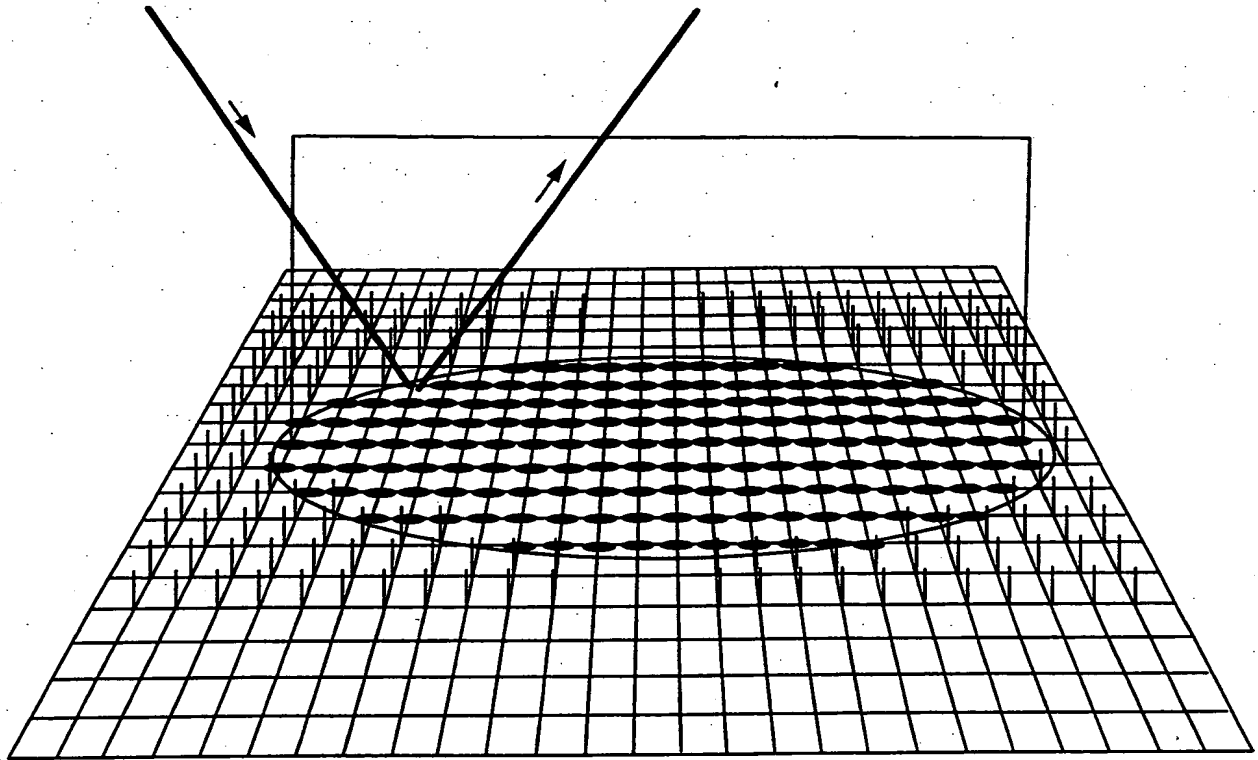
**Fig. 6**

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**Fig. 7**

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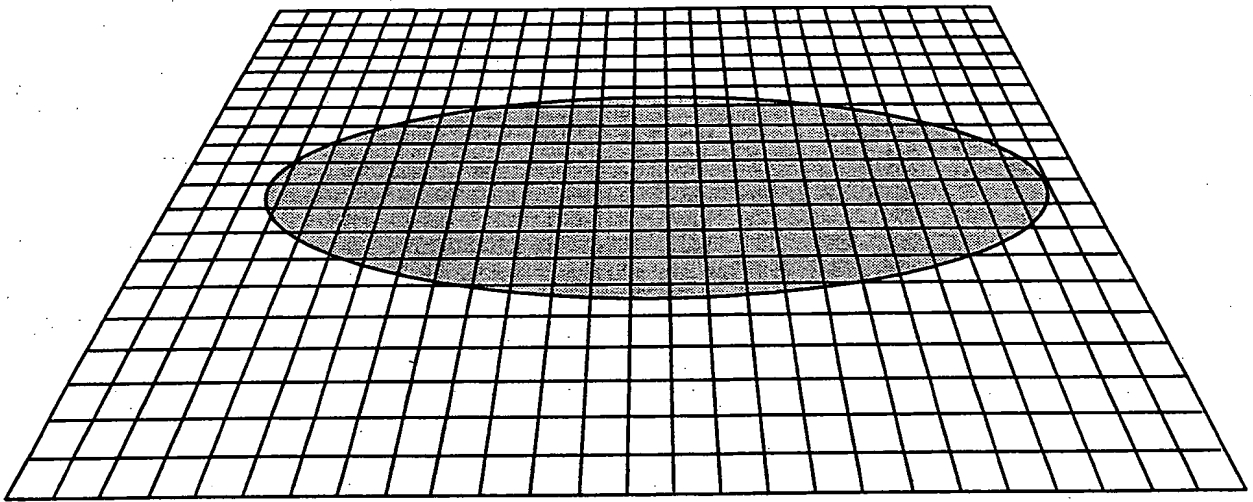


**Fig. 8**





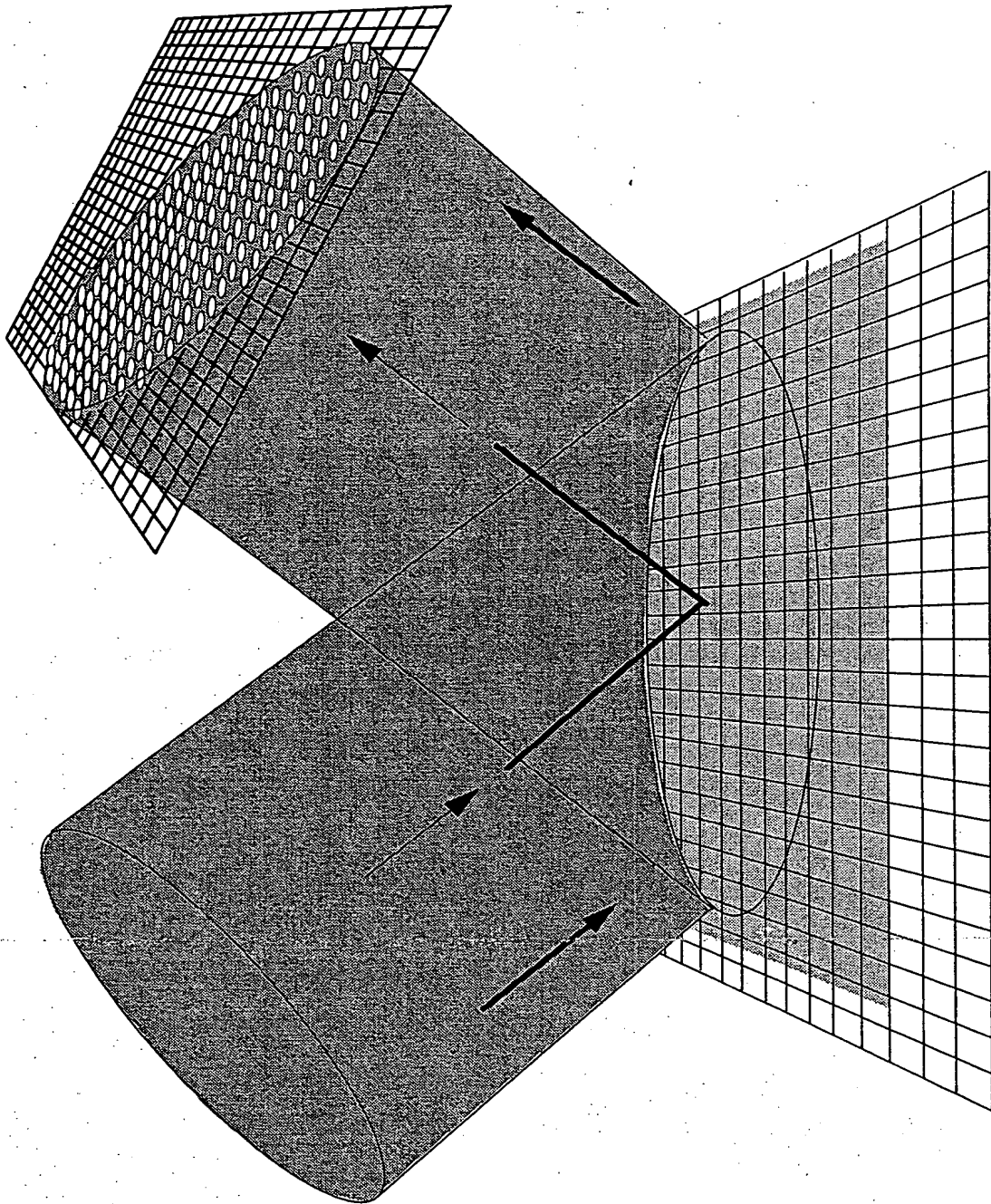
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**Fig. 9**



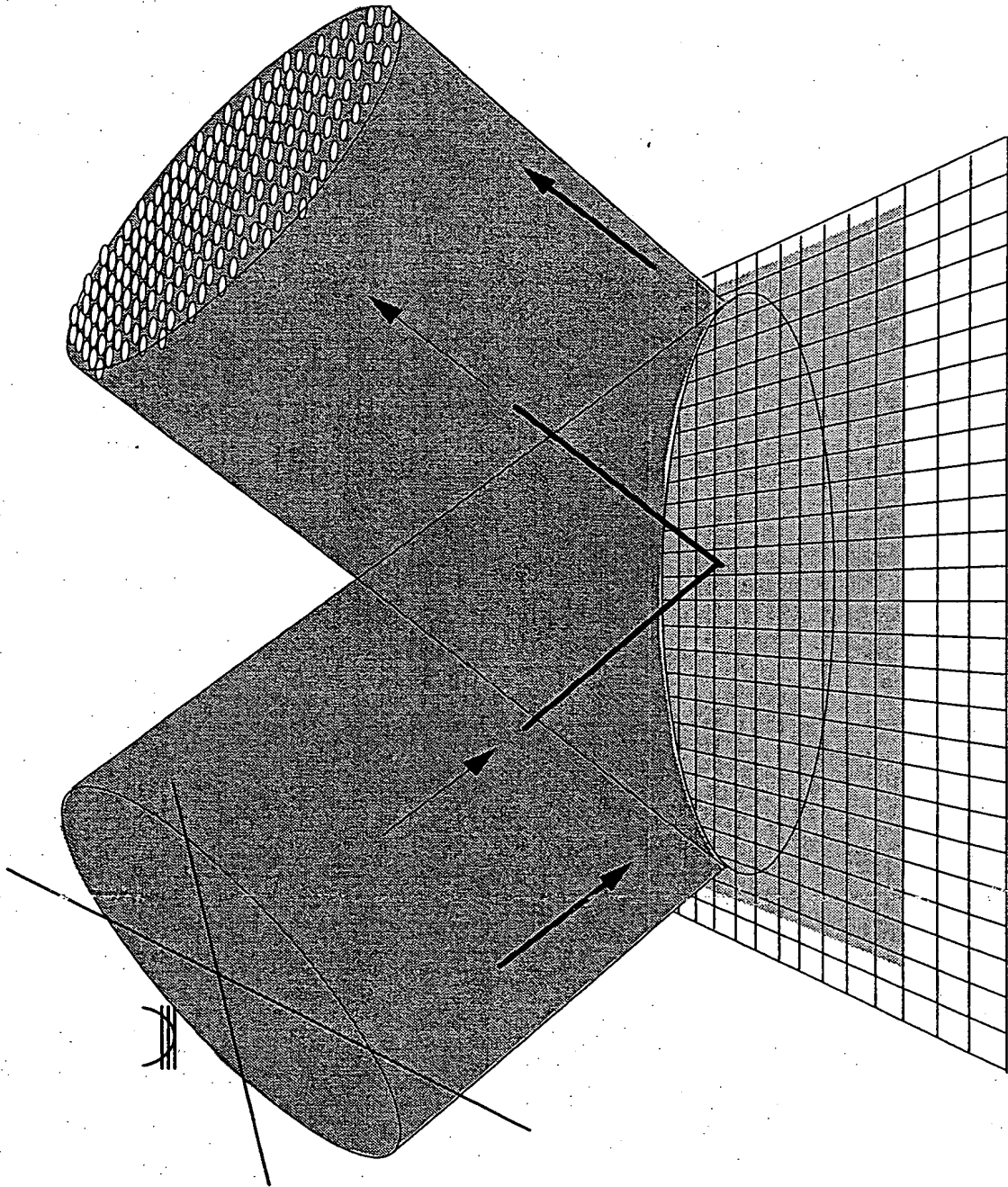
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**Fig. 10**



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**Fig. 11**



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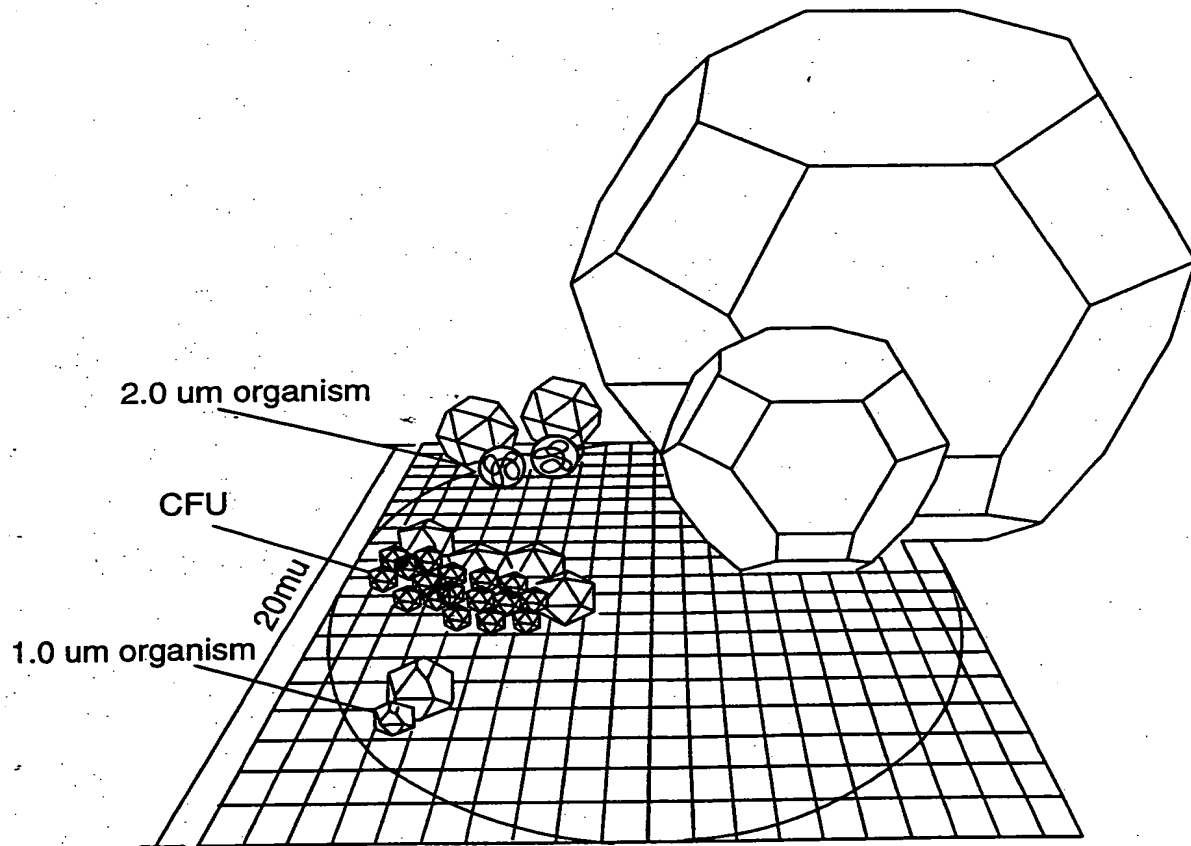
### Examples of Optical Signal Formats

Principle	Label Type	Instrument	DDx Status
SCATTER	POLYMER BEADS/PARTICLES SILICA BEADS/PARTICLES MAGNETIC BEADS/PARTICLES METAL BEADS/PARTICLES METAL COATED BEADS/PARTICLES	SCATTEROMETRY	DEMONSTRATED
OPTICAL ABSORPTION	COLLOIDAL GOLD MAGNETIC BEADS	REFLECTOMETRY PHOTOMETRY	SCHEDULED
CHANGE IN POLARIZATION STATE	POLYMER BEADS SILICA BEADS	ELLIPSOMETRY (WITH COMPENSATOR) POLARIMETRY (W/OUT COMPENSATOR)	SCHEDULED
CHANGE IN REFRACTIVE INDEX	HIGH REFRACTIVE INDEX OR OPTICALLY ACTIVE MATERIALS	ELLIPSOMETRY (WITH COMPENSATOR) POLARIMETRY (W/OUT COMPENSATOR)	SCHEDULED
CHIRAL EFFECTS	AZIO DYES CHIRAL COMPOUNDS		ENVISIONED
DIFFRACTION EFFECTS	PATTERNED SURFACE	INTERFEROMETRY	ENVISIONED
SPECTROSCOPIC EFFECTS	WAVELENGTH SELECTIVE MATERIALS	SPECTROMETER	ENVISIONED

**FIG. 12**



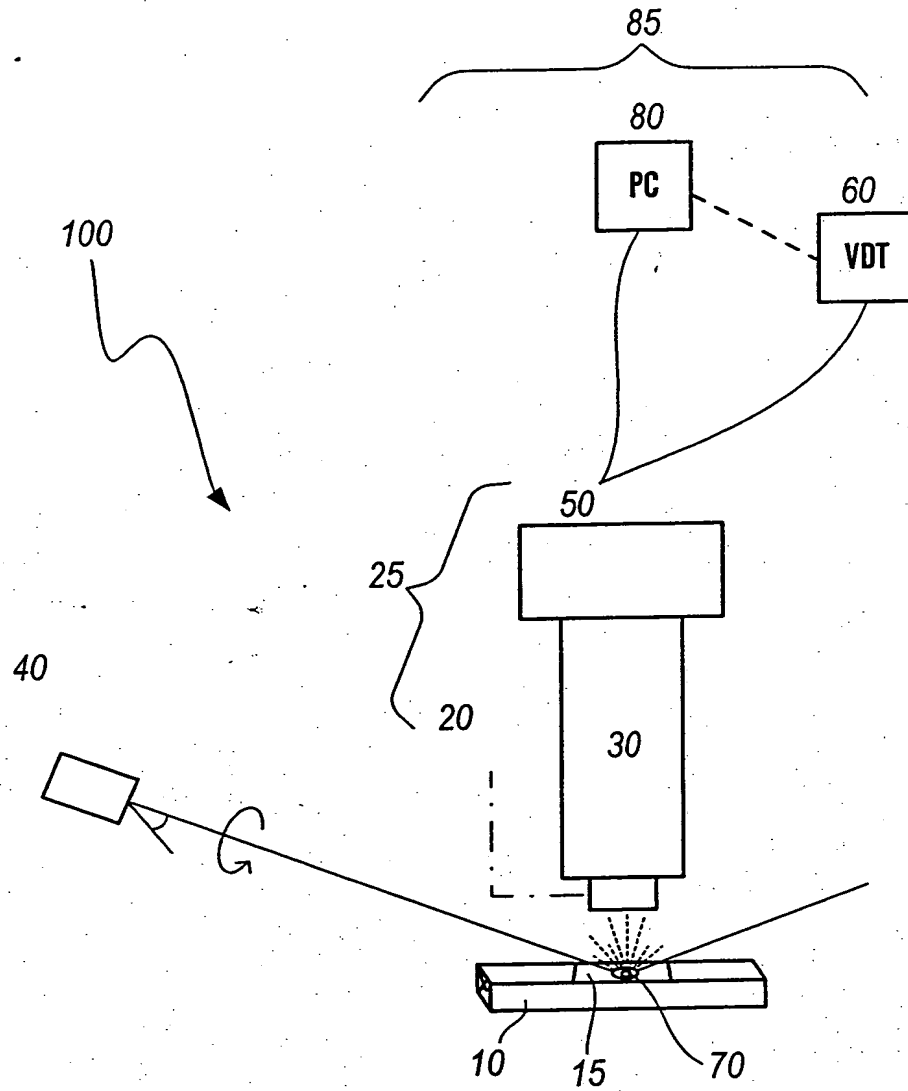
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**Fig. 13**



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**FIG. 14**

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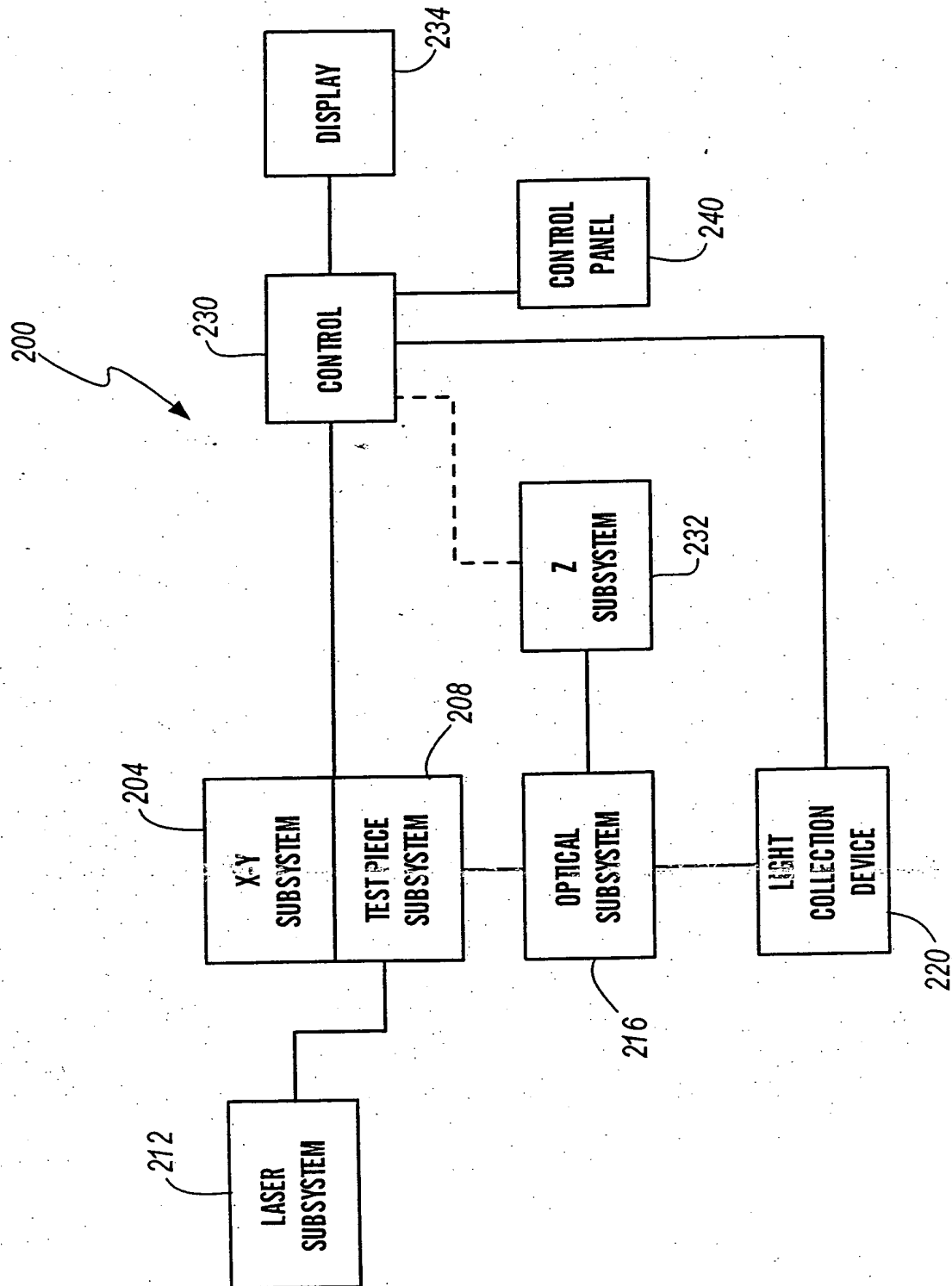
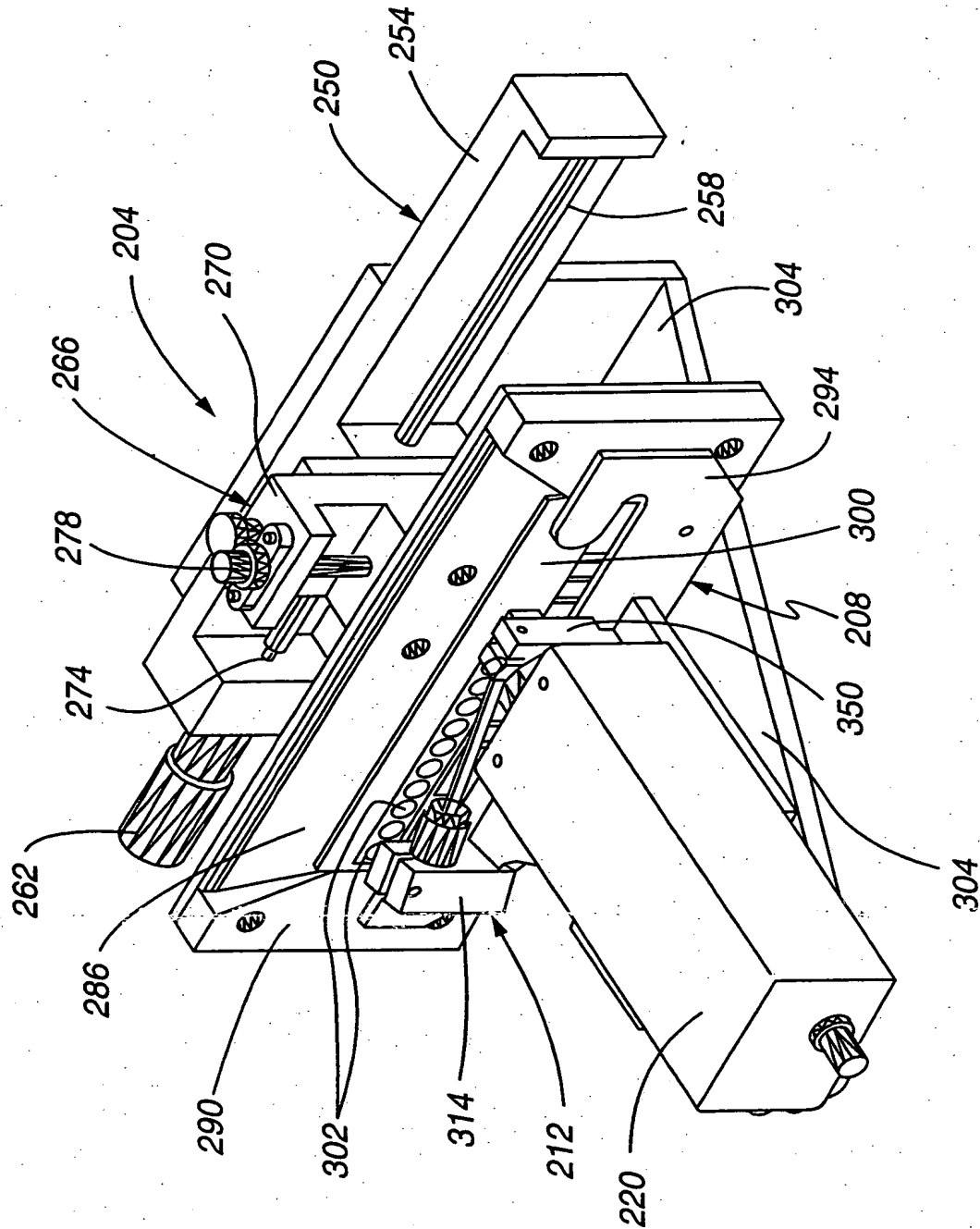


FIG. 15

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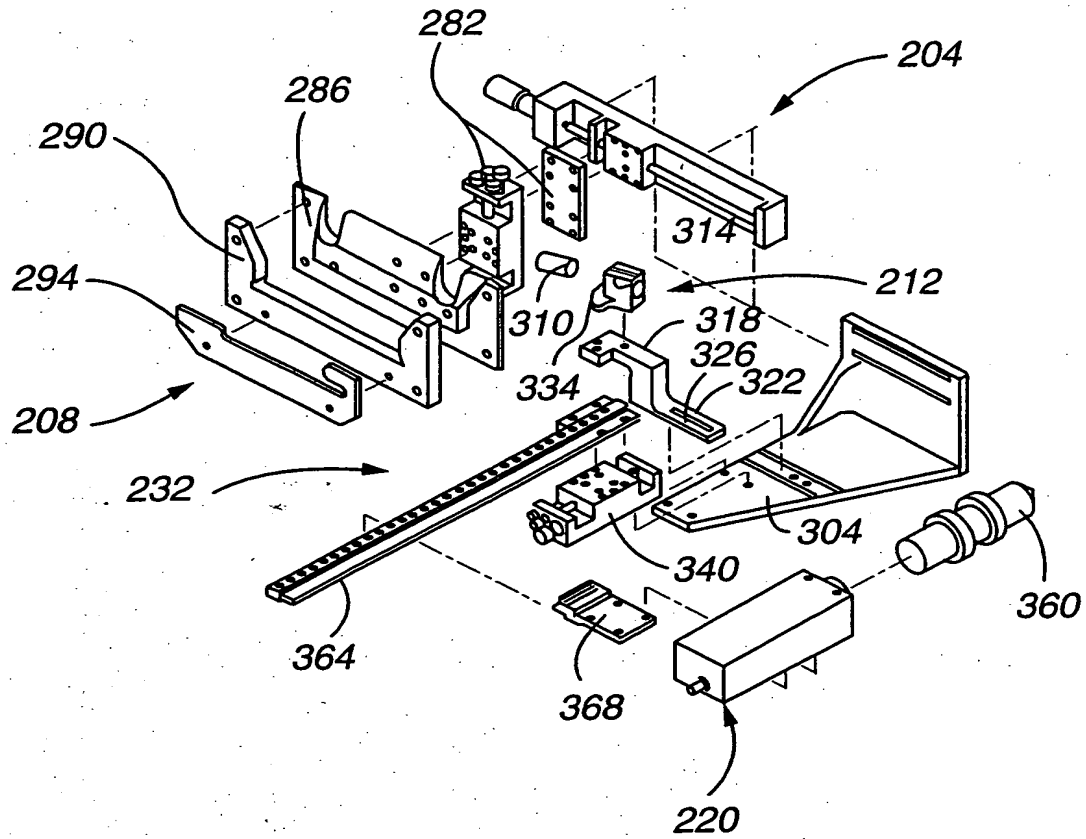


**Fig. 16**





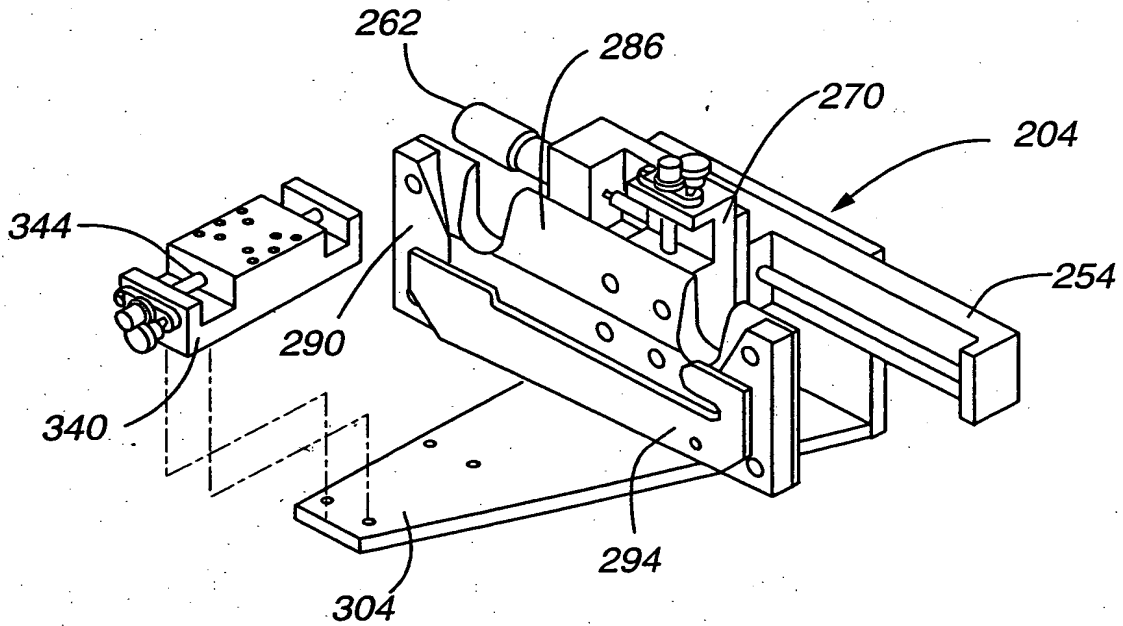
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**Fig. 17**



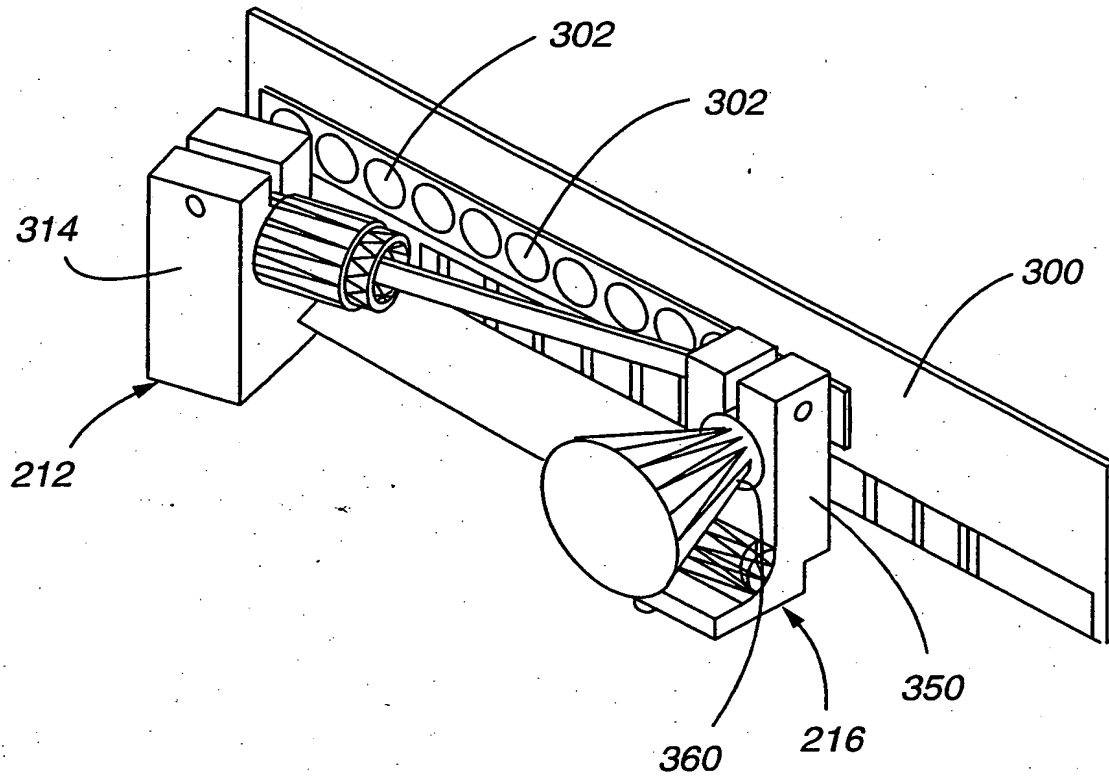
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**FIG. 18**



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**Fig. 19**

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**2X MAG**

COLUMN

0 1

**4X MAG**

ROW 1 012

ROW 2 543

ROW 3 678

ROW 4 11 10 9

**IP Controls**

Gain 2033 2500 3119

Shutter 2033 2500 3119

Interpolation Type  Subsample

Coordinated (screen) X Position  Y Position

Display ☒ On

1st Filter ☐ Off

2nd Filter ☐ Off

Filter 1

Parameter

Lower Value  Upper Value

Interval

Filter 2

Parameter

Lower Value  Upper Value

Interval

Connectivity 4/8 (8)

Lookup ☐ Off

X Value  Power X

Morphology ☐ Off

Lower Value  Upper Value

Coordination In

Coordination In  Z Focus

Y Start  X Start

Spots to text

**10X MAG**

ROW 1 0123

ROW 2 987654

ROW 3 1011121314151617

ROW 4 26272829303132333435

ROW 5 26272829303132333435

ROW 6 45444342414039383736

ROW 7 48474645444342414039383736

ROW 8 65646362616059585756

ROW 9 6667686970717273

ROW 10 8180797877767574

ROW 11 828384858687

ROW 12 91908988

Fig. 20

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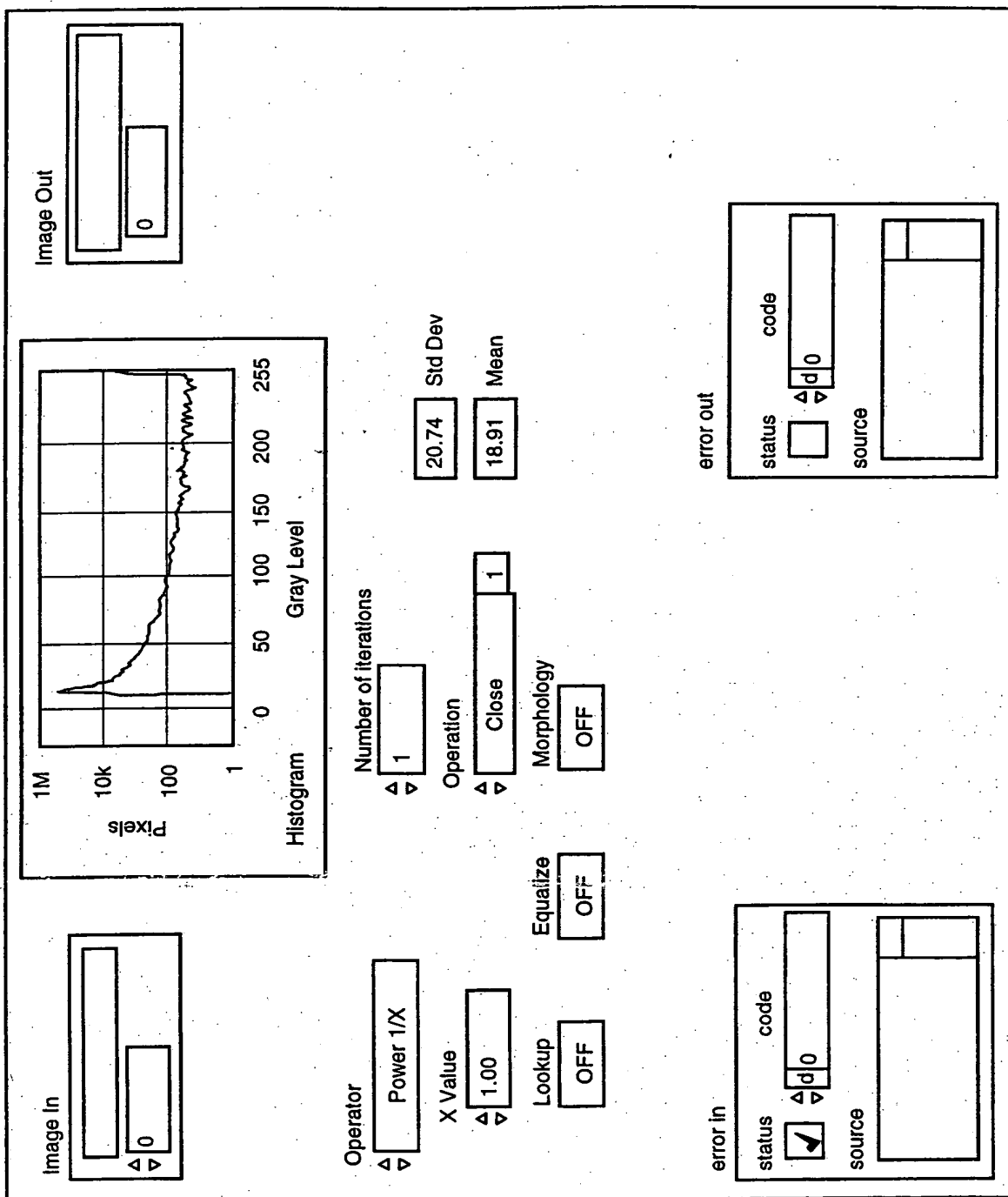
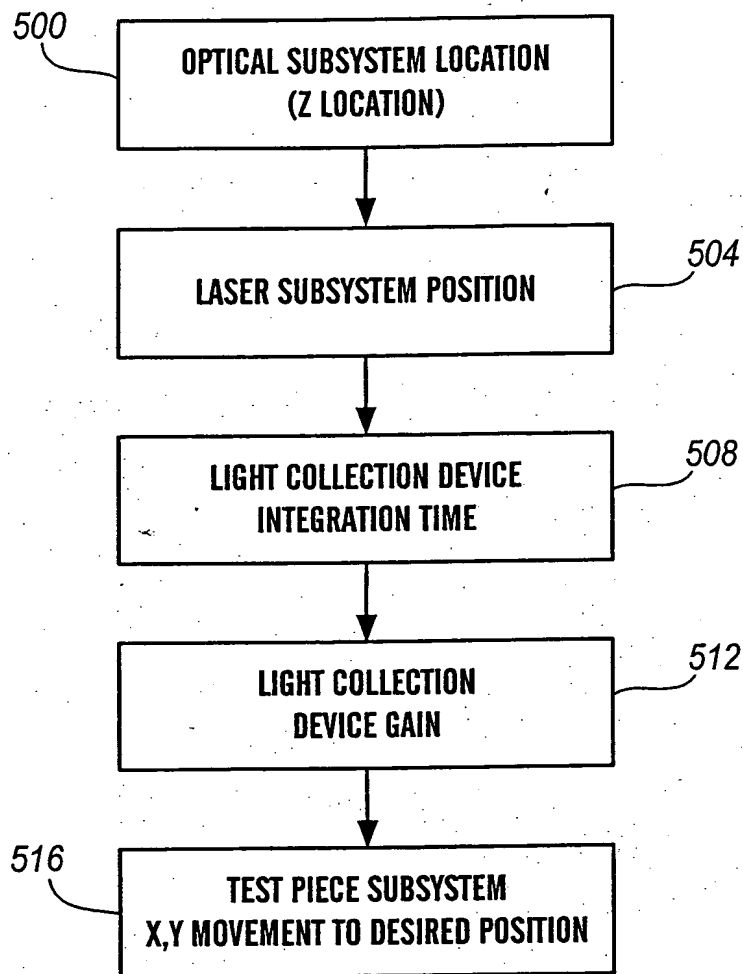


Fig. 21



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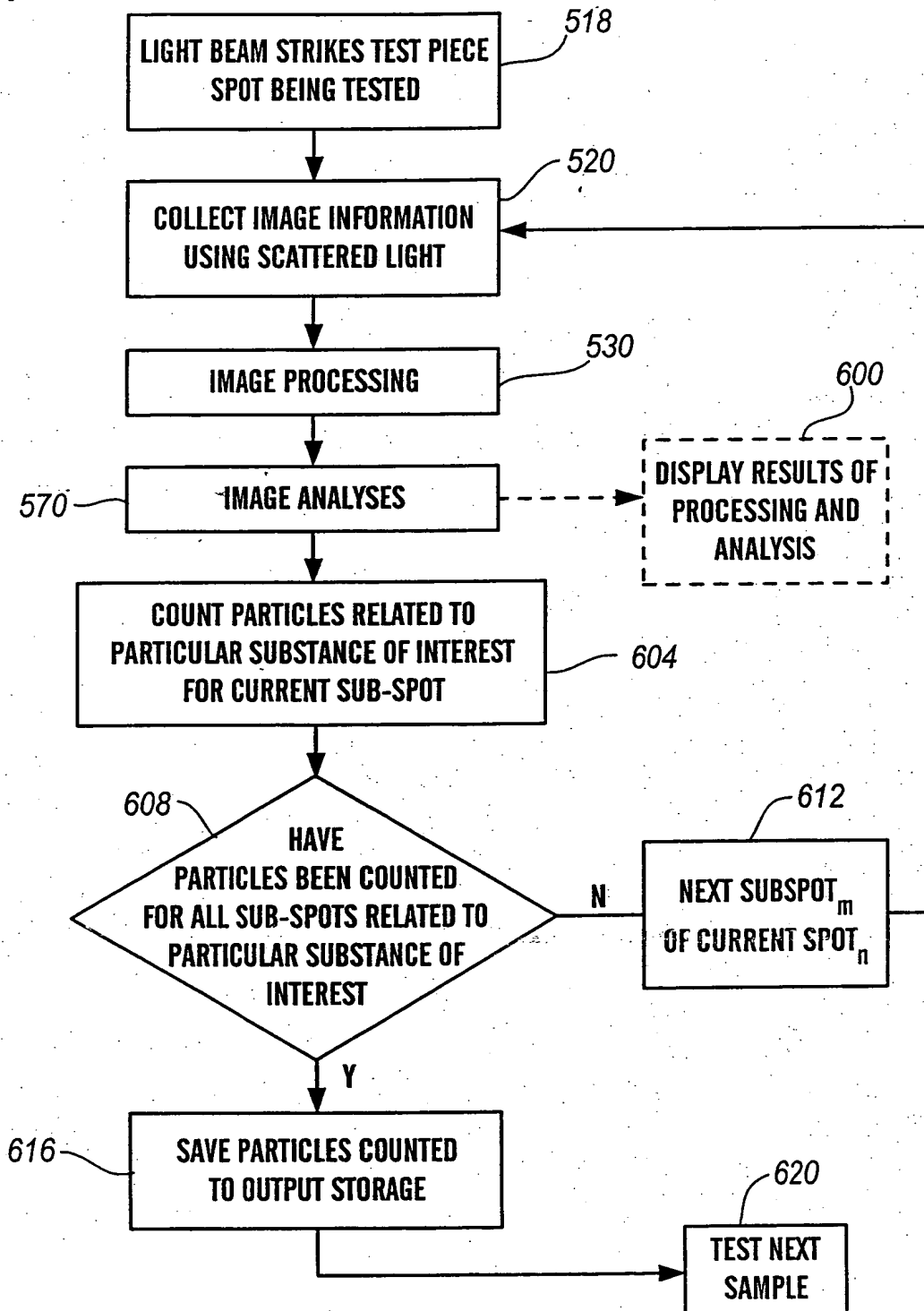
### INSTRUMENT SETUP



**FIG. 22**

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**TESTING**

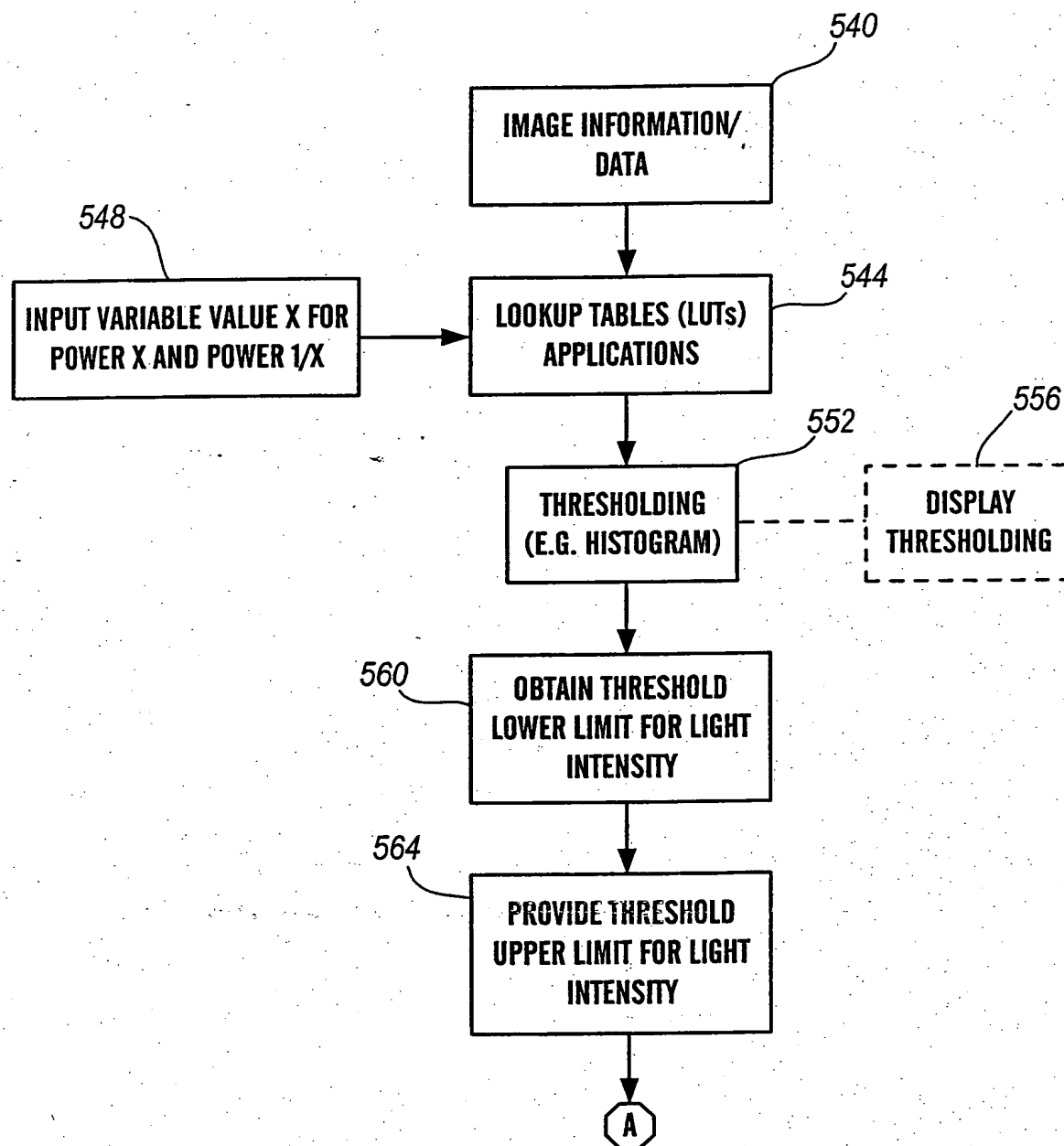


**FIG. 23**



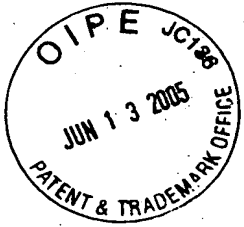
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# IMAGE PROCESSING



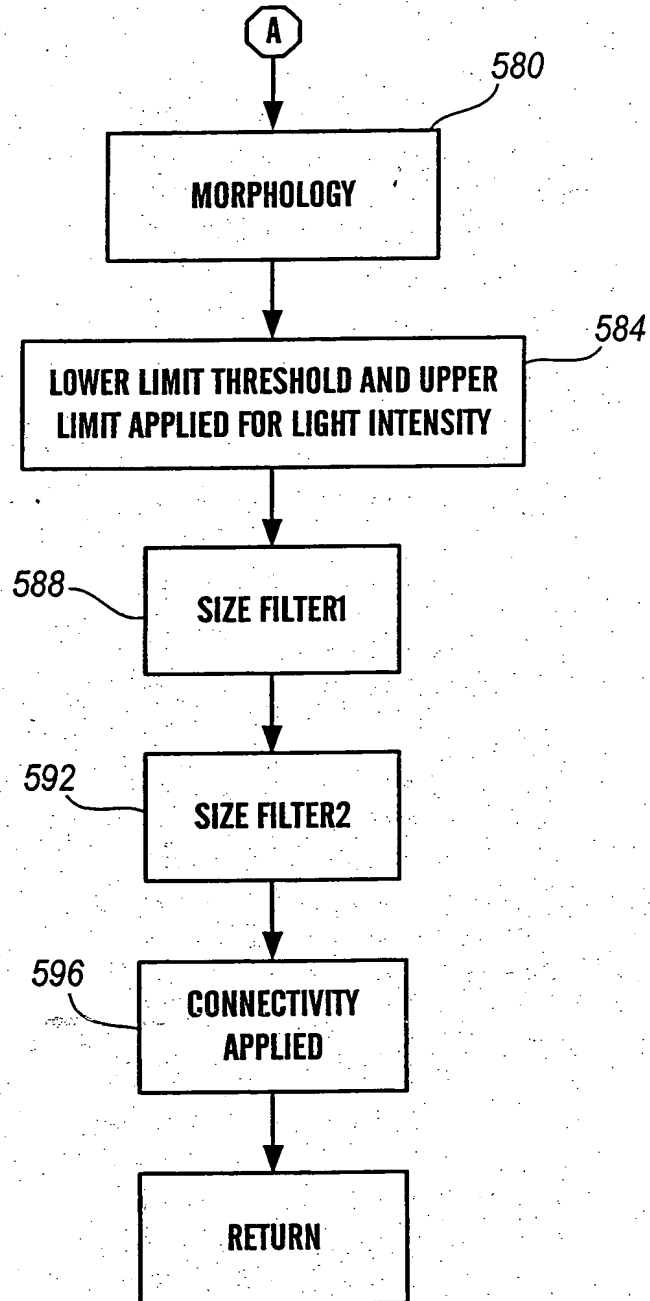
**FIG. 24**





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**IMAGE ANALYSIS**



**FIG. 25**